

WHAT IS CLAIMED IS:

1. A method for making a microwave circuit, comprising:
 - a) depositing a thickfilm dielectric over a ground plane by,
 - i) depositing a first layer of thickfilm dielectric over the ground plane;
 - 5 ii) air drying the first layer to allow solvents to escape, thereby increasing the porosity of the first layer;
 - iii) oven drying the first layer;
 - iv) depositing additional layers of thickfilm dielectric on top of the first layer, oven drying after the deposition of each layer;
 - 10 and
 - v) firing the deposited layers; and
 - b) forming a conductor on the thickfilm dielectric.
2. The method of claim 1, further comprising forming a thickfilm resistor near the thickfilm dielectric by,
 - a) placing a polymer screen over the thickfilm dielectric, and applying pressure to the polymer screen until it at least partially conforms to
 - 5 a contour of the thickfilm dielectric; and
 - b) printing the thickfilm resistor through the polymer screen.
3. A method for making a microwave circuit, comprising:
 - a) depositing a dielectric over a ground plane; and
 - b) forming a conductor on the dielectric by,
 - i) depositing a conductive thickfilm on the dielectric;

- 5 ii) subsintering the conductive thickfilm;
- iii) patterning the conductive thickfilm to define at least one
 conductor;
- iv) after subsintering, etching the conductive thickfilm to
 expose the at least one conductor; and
- 10 v) firing the exposed at least one conductor at a full sintering
 temperature.

- 4. The method of claim 3, wherein the dielectric is deposited by,
 - a) depositing a first layer of thickfilm dielectric over the ground plane;
 - b) air drying the first layer to allow solvents to escape, thereby
 increasing the porosity of the first layer;
 - 5 c) oven drying the first layer;
 - d) depositing additional layers of thickfilm dielectric on top of the first
 layer, oven drying after the deposition of each additional layer; and
 - e) firing the deposited layers.

- 5. The method of claim 3, further comprising forming a thickfilm resistor
 near the glass dielectric by,
 - a) placing a polymer screen over the glass dielectric, and applying
 pressure to the polymer screen until it at least partially conforms to
5 a contour of the glass dielectric; and
 - b) printing the thickfilm resistor through the polymer screen.

- 6. A method for making a microwave circuit, comprising:

- a) depositing a first dielectric over a ground plane;
 - b) forming a conductor on the first dielectric;
 - c) measuring the impedance of the conductor, and using the
5 measured impedance and a desired impedance to solve an
equation for a dry print thickness of a second, thickfilm dielectric;
 - d) depositing the second, thickfilm dielectric over the conductor and
first dielectric, thereby encapsulating the conductor between the
first and second dielectrics; and
 - 10 e) forming a ground shield layer over the first and second dielectrics.
7. The method of claim 6, wherein the impedance measurement is
performed using time domain reflectometry.
8. The method of claim 6, wherein the impedance measurement is
performed on a test structure formed in parallel with the microwave
circuit, using the same process used to form the microwave circuit.
9. The method of claim 6, wherein the first dielectric is a thickfilm
dielectric.
10. The method of claim 9, wherein:
- a) if the measured impedance of the conductor is less than the
desired impedance, the dry print thickness of the second thickfilm
dielectric is thicker than a dry print thickness of the first thickfilm
5 dielectric; and

- b) if the measured impedance is greater than the desired impedance, the dry print thickness of the second thickfilm dielectric is thinner than a dry print thickness of the first thickfilm dielectric.
- 11. The method of claim 6, further comprising, conductively coupling the ground shield layer to the ground plane.
- 12. The method of claim 6, wherein at least one of the first and second dielectrics is deposited by,
 - a) depositing a first layer of thickfilm dielectric over the ground plane;
 - b) air drying the first layer to allow solvents to escape, thereby
 - 5 increasing the porosity of the first layer;
 - c) oven drying the first layer;
 - d) depositing additional layers of thickfilm dielectric on top of the first layer, oven drying after the deposition of each additional layer; and
 - e) firing the deposited layers.
- 13. The method of claim 6, further comprising forming a thickfilm resistor near the dielectrics by,
 - a) placing a polymer screen over the dielectrics, and applying
 - 5 pressure to the polymer screen until it at least partially conforms to a contour of the dielectrics; and
 - b) printing the thickfilm resistor through the polymer screen.
- 14. A method for making a microwave circuit, comprising:

- a) depositing a first dielectric over a ground plane;
 - b) forming a conductor on the first dielectric;
 - c) depositing a second dielectric over the conductor and first
5 dielectric, thereby encapsulating the conductor between the first
and second dielectrics; and
 - d) forming a ground shield layer over the first and second dielectrics
by,
 - i) precoating the first and second dielectrics with a metallo-
10 organic layer; and then
 - ii) depositing a thickfilm ground shield layer over the precoat
layer.
15. The method of claim 14, wherein the second dielectric is a thickfilm
dielectric, further comprising, prior to depositing the second, thickfilm
dielectric, measuring the impedance of the conductor and using the
measured impedance and a desired impedance to solve an equation for
5 a dry print thickness of the second, thickfilm dielectric.
16. The method of claim 14, wherein at least one of the first and second
dielectrics is deposited by,
 - a) depositing a first layer of thickfilm dielectric over the ground plane;
 - b) air drying the first layer to allow solvents to escape, thereby
5 increasing the porosity of the first layer;
 - c) oven drying the first layer;

- d) depositing additional layers of thickfilm dielectric on top of the first layer, oven drying after the deposition of each additional layer; and
- e) firing the deposited layers.

17. The method of claim 14, wherein depositing the thickfilm ground shield layer comprises:

- a) placing a polymer screen over the dielectrics, and applying pressure to the polymer screen until it at least partially conforms to a contour of the dielectrics; and
- b) printing the thickfilm ground shield layer through the polymer screen.

18. The method of claim 14, further comprising forming a thickfilm resistor near the dielectrics by,

- a) placing a polymer screen over the dielectrics, and applying pressure to the polymer screen until it at least partially conforms to a contour of the dielectrics; and
- b) printing the thickfilm resistor through the polymer screen.

19. A method for making a microwave circuit, comprising:

- a) depositing a first dielectric over a ground plane;
- b) forming a conductor on the first dielectric;
- c) depositing a second dielectric over the conductor and first dielectric, thereby encapsulating the conductor between the first and second dielectrics; and

- d) forming a ground shield layer over the first and second dielectrics by,
 - i) placing a polymer screen over the first and second dielectrics, and applying pressure to the polymer screen until it at least partially conforms to a contour of the dielectrics; and
 - ii) printing a thickfilm ground shield layer through the polymer screen.
- 10
20. The method of claim 19, wherein the second dielectric is a thickfilm dielectric, further comprising, prior to depositing the second, thickfilm dielectric, measuring the impedance of the conductor and using the measured impedance and a desired impedance to solve an equation for a dry print thickness of the second, thickfilm dielectric.
- 5
21. The method of claim 19, wherein at least one of the first and second dielectrics is deposited by,
- a) depositing a first layer of thickfilm dielectric over the ground plane;
 - b) air drying the first layer to allow solvents to escape, thereby increasing the porosity of the first layer;
 - c) oven drying the first layer;
 - d) depositing additional layers of thickfilm dielectric on top of the first layer, oven drying after the deposition of each additional layer; and
 - e) firing the deposited layers.
- 5

22. The method of claim 19, further comprising forming a thickfilm resistor near the thickfilm dielectrics by,
- 5 a) placing a polymer screen over the thickfilm dielectrics, and
 applying pressure to the polymer screen until it at least partially
 conforms to a contour of the thickfilm dielectrics; and
- b) printing the thickfilm resistor through the polymer screen.